ANTHER DEVELOPMENT IN SWEET CHERRY

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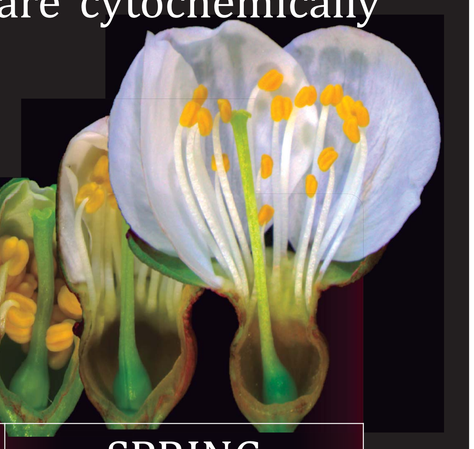
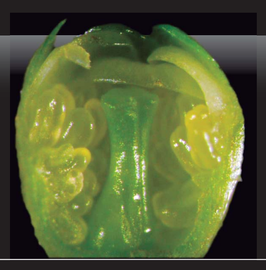
Dormancy is a strategy of woody perennials to survive to cold winter temperatures, but is also a requisite for proper flowering, with chilling requirements specific for each cultivar. However, the biology behind these requirements remains obscure. Anther and pollen development is synchronized with the seasons. The fact that clear developmental steps are conserved in this process suggests that this may be useful to frame these steps in a dormancy context. In this work, anther development and pollen formation are cytochemically characterized in relation to dormancy.



Flower bud growth is halted during winter, when the flower enters a dormant stage...

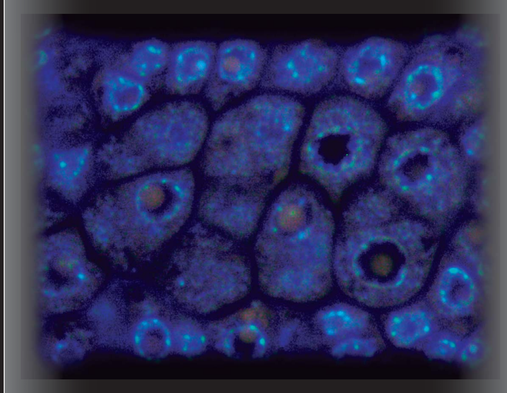


...and resumes growth prior to spring

Endo- DORMANCY	Eco-DORMANCY	MEIOSIS	SPRING GROWTH
← Chilling accumulation →	← Heat accumulation →		

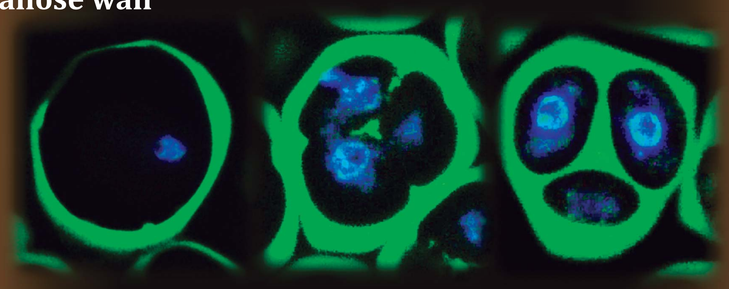
SPOROPHYTIC	GAMETOPHYTIC	
	MICROSPOROGENESIS	MICROGAMETOGENESIS

During winter, the anther showed their characteristic shape with the four locules

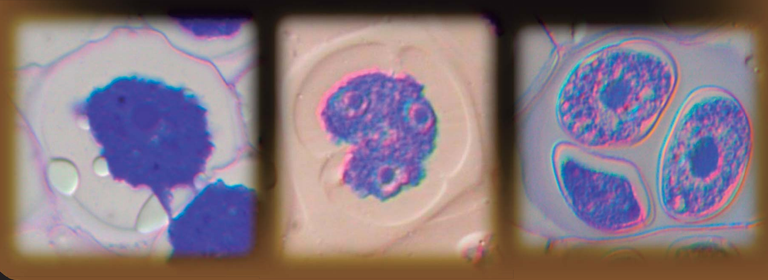


At **dormancy**, different anther tissues were differentiated: the sporgenous tissue, the tapetum, and the different anther layers

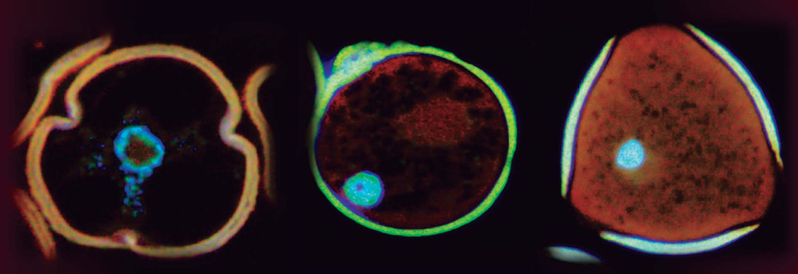
First and meiotic second divisions occurred when the pollen mother cells were completely isolated by a **thick callose wall**



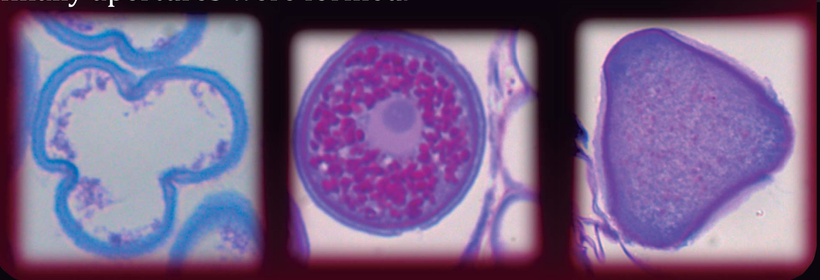
Cytokinesis, cytoplasm was equally distribute to the four microspores, forming a **tedrad**



Released microspores were mononucleated and haploid. Then suffered a mitotic division, two nuclei vegetative and generative (bright).



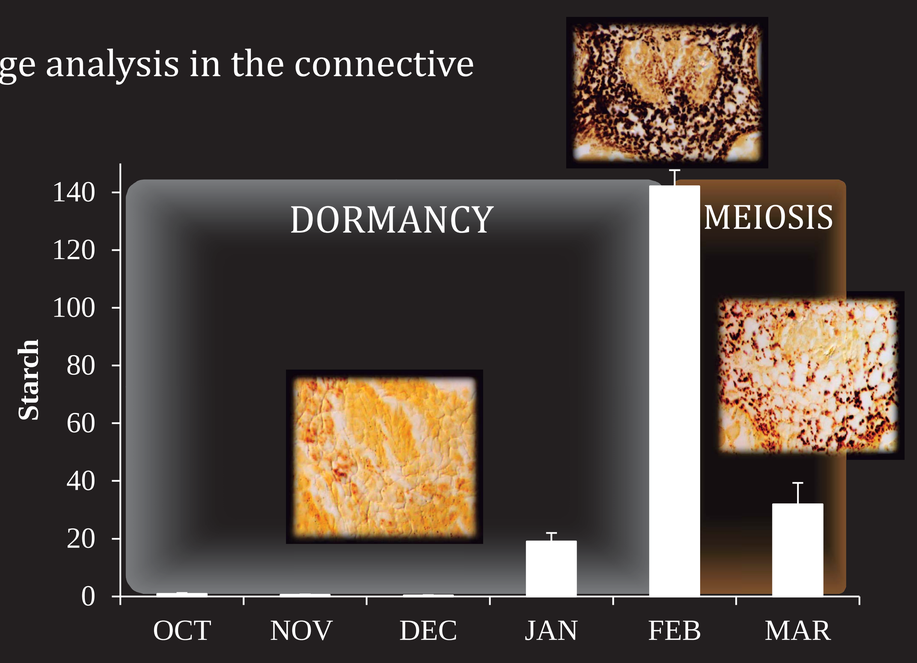
Microspores with a wrinkled wall were acquiring a spherical shape with a significant starch accumulation to finally apertures were formed.



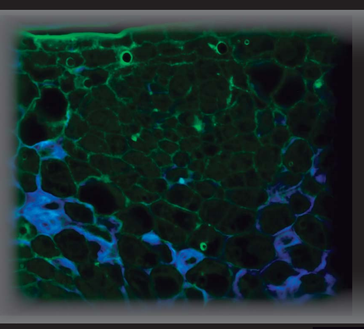
Intense **changes** also occurred in the **connective** and the **pre-vascular tissue**:

Starch was quantified by image analysis in the connective tissue of anthers.

No starch was detected during dormancy, but a significant peak of starch occurred after chilling fulfillment and before meiosis. Afterwards, by the time of microspore release, starch was vanished.

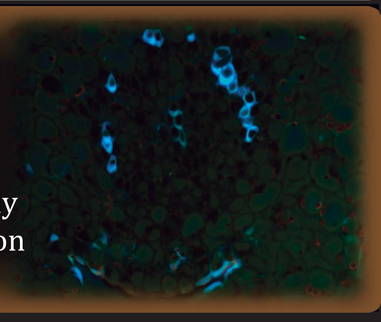


DORMANCY



Pre-vascular tissue, with no vessels, was presented during dormancy.

MEIOSIS



First xylem vessels appeared, concomitantly with starch accumulation in the connective tissue

Anthers entered dormancy with the sporogenous tissue and the surrounded layers differentiated, as well as the vascular procambium. During dormancy no morphological changes were detected, but an intense activity took place at dormancy release: starch accumulation, vessel differentiation and meiosis, which occurred just before flower growth.

ACKNOWLEDGEMENTS
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